Sustaining the Integration of ICT in Accounting Education

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Abstract

This paper reports on the critical success factors necessary to promote sustainability in the integration of information and communications technology (ICT) in accounting education. The integration was implemented in order to better align accounting education to accounting practice in Higher Education. The alignment is only possible through the use and understanding of accounting software packages (ICT) which are integrated into the entire learning experience of the accounting diploma student. Firstly, it is argued that the iterative cycles of design-based research in the implementation process together with action research facilitated the refinement process. The continuous feedback cycles are a learning process for the teaching and learning with ICT to be sustained. Secondly, the close working relationship to industry, management support and staff interventions are integral parts of the alignment and it is argued that these are the more imperative key success factors in the sustainability of the alignment process of accounting education to accounting industry. Thirdly, best practices emanating from the refinements of the implementation processes over the period from 2011 to date will be presented. The teaching and learning practices that will be highlighted cover assessment practices, the knowledge and skills balance for the graduate and tutor roles and responsibilities. The results of an impact study of the integration of ICT on the graduateness and employability of the graduates will be highlighted. Finally, the need for further research in the dynamic work place, fourth industrial revolution (4IR) and the future of accounting education knowledge and skills alignment will be presented.

Keywords: *Accounting, Education, Information and communication technology (ICT), Integration, Implementation of ICT.*

1. Introduction

In 2011, the University of Johannesburg, South Africa initiated the Diploma in Accountancy with elements of information and communication technologies (ICT) embedded in the full three years of the curriculum of the accounting and finance subjects. The integration was implemented in order to better align accounting education to accounting practice [1, 2]. This alignment is only possible through the use and understanding of accounting software packages (ICT) which are integrated into the entire learning experience of the accounting diploma student. “Additionally, the course has been modelled to imitate work place situations leading to a simulated work-integrated learning experience” [3].

1.2 Research methodology

Although, design-based research (DBR) formed the basis of the development of an implementation plan for the integration of ICT into accounting education [1, 4] the iterative cycles of DBR in the actual implementation process has facilitated a continuous learning process for the teaching and learning with ICT to be sustained. The characteristics of DBR that facilitated a continuous learning process from 2011 to date of the implementation, includes the confluence of various approaches from the team of lecturers to effect change and the real-life settings which promoted the simulated work-integrated learning experiences [1, 2, 3].

2. Design principles and critical success factors

The continuous feedback cycles of DBR in the implementation process has highlighted the high degree of similarity between the critical success factors (CSF) found in a systematic literature review study of industry [5, 6] for the successful implementation of Electronic Resource Planning (ERP) and the design principles [1, 2] for the successful integration of ICT in accounting education. The close working relationship to industry[1, 7], management support and staff interventions are integral parts of the alignment and it is argued that these are the more imperative key success factors or design principles in the sustainability of the alignment process of accounting education to accounting industry [1, 2].

3. Implementation best practices

Best practices and lessons learnt emanating from the refinements of the implementation processes over the period from 2011 to date were developed from the continuous feedback cycles being interrogated. The teaching and learning practices that will be highlighted cover assessment practices, the knowledge and skills balance for the graduate and tutor roles and responsibilities.

3.1 Assessment practices

The assessment of the simulated work environment in the financial accounting subjects has been by means of a portfolio of evidence (POE) which is submitted four times a year and forms part of the students' final mark with a total weighting of between 10 to 15%. Written formative and summative assessments make up the balance of the subject mark. The main challenge has been to ensure that the POE submissions are valid and to eliminate the risk of plagiarism. A system of personal codes has been designed for each student. The code is used in the creation of the company parameters and for each transaction recorded in the accounting system. The embedded code is verified for each student before the student is authorized to submit the POE for assessment. The system of personalized codes is in addition to the emphasis placed on passwords and the protection of financial information as is the case in the real-to-life financial environment.

3.2 Balance between knowledge and skills

It is imperative that the theory presented matches the development of the skill. The learning objectives for the development of the skill will need to clarify the value added to concepts of the theory. The integration model developed for the integration of accounting theory with the skills used in accounting practice [1] supports this important notion of the necessity to balance the knowledge and skills development.

3.3 Tutor roles and responsibilities

The tutors, are normally graduates of the diploma and all been certified as competent on the accounting software. It has been established that for every 50 students at least 4 tutors are needed to support the learning process. The tutors verify and assess the POEs and are responsible for the tutorial sessions. The tutors take on a mentoring role and the students appreciate the assistance of their peers in the development of the skills on the accounting software.

4. Graduateness and employability

The results of an impact study [3] of the integration of ICT reflect that the graduateness has been enhanced through better ICT skills, better communication and through a greater engagement with their study material. This was evidenced by a shorter study period to graduation. The impact study further proved a significant quicker employment of the graduates and that the study to employment cycle has been reduced by 7.4 months [3]. The graduates' employability attributes reflect that the diploma graduates not only found quicker employment but that the employment was more closely related to their studies [3].

5. Future research

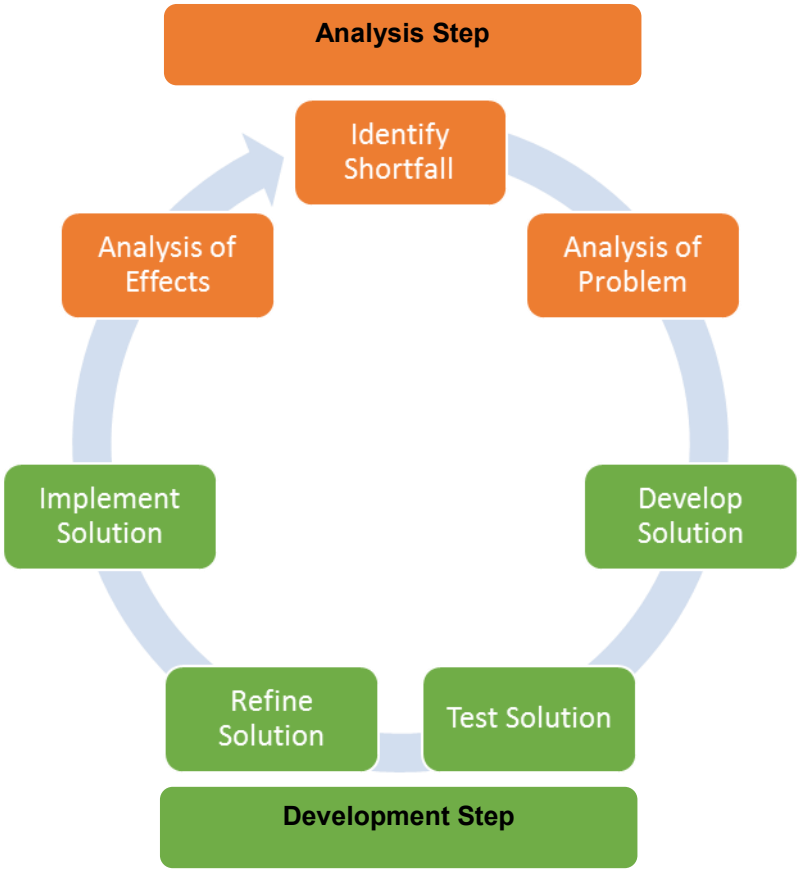

Figure 1: Proposed cycle for the continuous evolution of accounting education: Authors own depiction.

The cycle shown above is the proposed method to continuously evolve and improve the education methodology, in order to ensure that the students are more employable and have increased graduateness skills. This is divided into two steps, analysis and development. First, a shortfall or gap in graduate knowledge or skills is identified, for example, ICT is the industry standard in accounting but, graduates are unable to use ICT. Next, the problem is analysed; students are not learning ICT and are unprepared for the current accounting environment. This starts the development step. A programme to train students in ICT is then developed as an integrated part of their learning experience. This solution is then tested and refined until all the stakeholders are satisfied. The last phase of the development step is the implementation of the solution; the new ICT-integrated course is opened for students. This could be the final step if the goal was simply to improve the current learning experience of the graduates, however, in order to continuously evolve, the effect on the graduateness and employability of the new graduates must be analysed. The main purpose of this analysis is to identify further shortfalls or the presence of potential future shortfalls in the graduateness of the students.

Technology is dynamic and constantly improving at a fast rate [8]. Accountants are expected to be able to use new accounting technology when they are employed, this means that graduates who have been prepared and trained to use these technologies have an advantage over other graduates, which have not. This is a difficult task as not only does it take time to develop new programmes, but the time taken to educate the students, a matter of years, can mean that new technologies are already emerging. There simply is not enough time for a stop-start approach in the development of improved education methods. This is why the need for a continuous cycle has arisen, with a continuous cycle, improvements are made naturally and faster, as part of the ongoing process of analysis and development. This progressive evolution will allow for the creation of graduates that are more prepared for the actual environment in which they will be employed.

The current trends in technology are leaning towards the fourth industrial revolution and the use of cloud computing. Accounting software packages are already starting to make use of these advancements and accounting graduates need to be prepared to use them or face a work environment at a disadvantage. The fourth industrial revolution involves using linked computing to take over mundane or repetitive tasks. And, while these technologies are being implemented, the future is already being discussed, debated and developed.

Computers have several advantages over human beings, many of these stemming from being faster and more accurate with regards to calculations. AI is able to perform many simulations in a given set of parameters with specific goals, and through these simulations is able to develop methods to best achieve these goals. This is done through comparative analysis; was the new method more or less effective than the previous and can be used to determine patterns. There is another form of analysis, critical analysis, for which there is no basis in programming and therefore is currently impossible to teach an AI. Critical analysis involves the determination of sufficiency or effectiveness of results. Critical analysis should also be applied in choosing the goals for improving accounting education.

6. Conclusion

There is a need for further research in the dynamic work place, fourth industrial revolution (4IR) and the future of accounting education knowledge and skills alignment for the integration of ICT in accounting education to continue to add value to the graduate employability attributes. The goals for improving accounting education need to be focussed on adapting to develop the graduate into future employees, with the knowledge and skills that will allow them to survive in the future work environment. Not only should educators practice analysis in the improvement of their programmes but, should also teach critical analytical thinking methods. In the future where artificial intelligence can perform mundane tasks faster and more accurately than any human, critical analysis could be one of the only advantages left for graduates.

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